

Coastal Habitat Restoration in New Hampshire

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Overview

Part I:

- What Is A Saltmarsh?
- Functions & Values of Saltmarshes

Part II:


- Saltmarsh Restoration Issues & Remediation
- NH Salt Marsh Restoration Status

Part III:

- Case Studies
- Restoration Monitoring
- River Restoration

Part I:

- What Is A Saltmarsh?
- Functions & Values of Saltmarshes




What Is A Saltmarsh?

National Wetlands Inventory Definition:

“Flooded persistent emergent wetland”


Ecological definition:

“Salt marshes are intertidal areas, vegetated by grasses and other salt tolerant plants, collectively called halophytes.”




Functions & Values of Saltmarsh Ecosystems

- Nursery Area for Fish, Crustacea & Insects
- Protection Against Waves & Sea Level Rise
- Mosquito Control
- Invasive Species Control
- Maintain Classic NH Scenery



Part II:

- How Have Threatened This Environment? (Issues & Examples)
- How Do We Restore A Saltmarsh?



How Have Humans Threatened This Environment?

- **Tidal Restrictions**
(Improper Culvert Size)
- **Ditching & Draining**
(Mid 1800's WPA Projects)
- **Fill on the Marsh**
(Dredge Spoils)
- **Stormwater Inflow**
(Freshwater Runoff & Ponding)
- **Invasive Species**
(Phragmites, Narrow-Leaf Cattail, Purple Loosestrife)



Example:
Tidal Restrictions

Hampton Marshes, Hampton



Example:

Ditching & Draining

Hampton Marshes, Hampton



Example:

Fill on the Marsh

Awcomin Marsh, Rye



Example:

Stormwater Inflow

Parson's Creek, Rye



Example:

Invasive Species

Hampton





How Do We Restore A Marsh?

- Remove Tidal Restrictions
- Ditch Plugging & Pool/Panne Creation
- Remove Fill
- Perimeter Ditches to Remove Stormwater

Removal of Tidal Restrictions



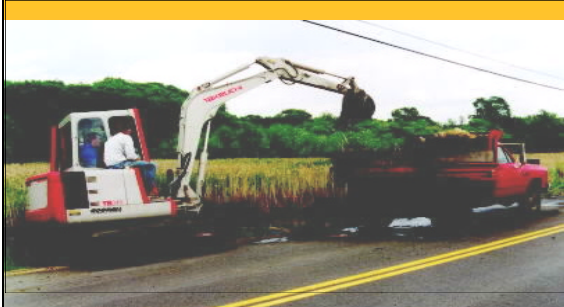
Ditch Plugging & Pool/Panne Creation



Removal of Fill



Perimeter Ditches to Remove Stormwater



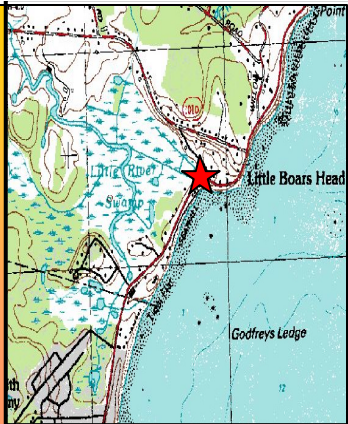
Part III:

- NH Saltmarsh Restoration Status in NH
- Case Studies: Awcomin Marsh, Little River, Pickering Creek
- Other Projects in Planning or Underway
- Other Restoration Projects
- Saltmarsh Monitoring in NH



Case Study 1:

Little River – North Hampton

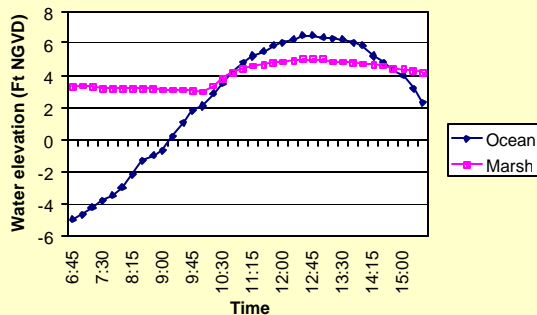


The Issue: Tidal Restriction (48" Culvert) Under Rt 1A.



The “Clogged Bathtub”

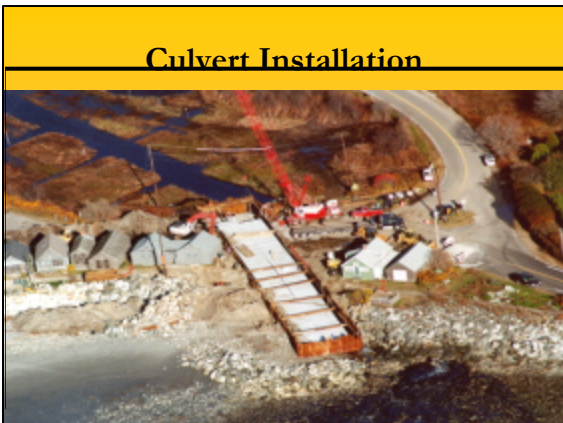
Little River Marsh Tides -- 10/17/97



Solution 1: Twin 6' x 12' Concrete Box Culverts



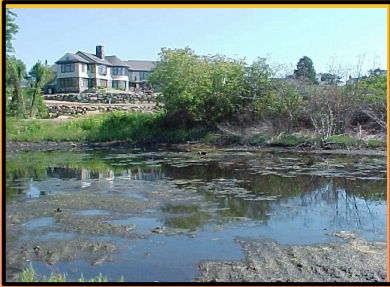
Culvert Installation



Solution 2: Widened Creek Channel



Solution 3: Open Water Habitat Creation



A Partnership For Success!



Little River Project Timeline

- 1790 – Locals petition NH Legislature to dig “Trunk”
- 1948 – The 48” culvert is installed at trunk outlet
- 1960s – Local landowner begins to preserve marshland
- 1990s – Studies on marsh and support for change
- 1996 – 500 year rain storm wrecks havoc
- 1998 – Communities support USACE Section 22 study
- 1999 – Design and monitoring begin
- 1999 – Appledore culvert is replaced
- 2000 (Sep. – Dec.) – Main culvert replacement
- 2001 – Post -restoration monitoring begins
- 2002 (Summer) – Attack of the killer mosquitoes

Unintended Consequences

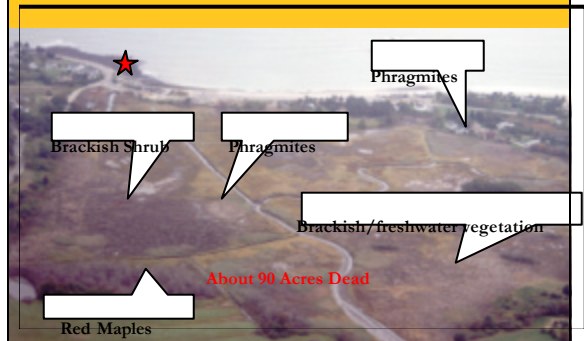
- Erosion at Mouth & Creation of Beach on the Inside of the Marsh
- Loss of Healthy Saltmarsh Vegetation
- Expansion of *Phragmites*?
- Mosquitoes



Loss of Healthy Vegetation



The “Dead Zone”



Expansion of Phragmites?



Mosquitoes!

- No Spraying of the Marsh Prior to 2001.
- Budget for Larviciding Marsh for 2003 = \$40,000.
- Freshwater vs Saltwater Natural History
- Hummocks of Brackish/Fresh plants – “Dead Zone”

Possible Next Steps

- Additional Pool/Panne Habitat Creation.
- Ditch Plugging.
- Last Culvert Replacement on Huckleberry Rd.



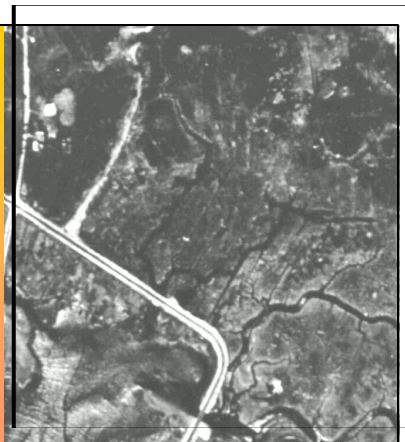
Case Study 2: Awcomin Marsh, Rye



The Issue: Historic Dredge Spoils on Marsh from Rye Harbor



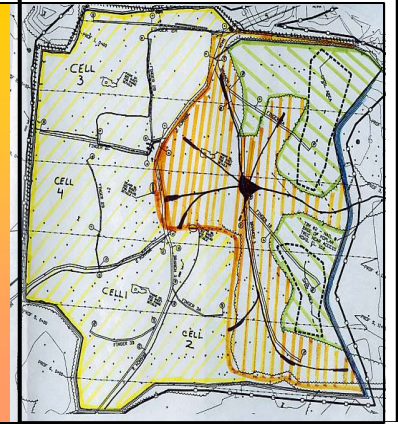
Awcomin Marsh
1939



Awcomin Marsh
1942



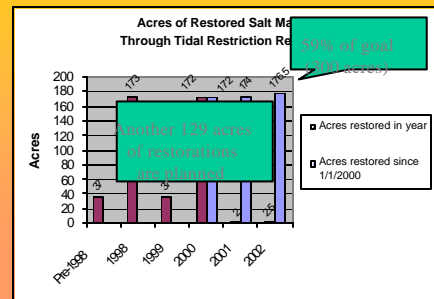
The
Restoration
Plan



Solution 1: Cut Phragmites & Determine “What Lies Beneath”



Restored salt marshes



Solution 2: Remove Fill & Restore Proper Elevations



Solution 3: New Tidal Channels



Revegetation: A Little Help From Volunteers



Bare Control Plots, Bare Root Seedlings, Plugs, & Seed Heads

Revegetation:
From Mud to
Vegetation In
1 Year

Now this area is
completely vegetated
with *Spartina*
alterniflora.



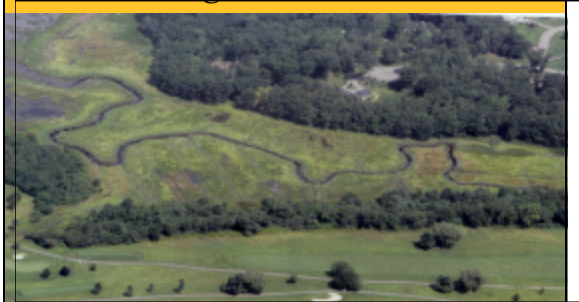
Next Steps

- Additional Marsh Re-grading on Surface of Marsh & at Upland Borders
- Additional Revegetation Planting on Surface of Marsh (*Spartina alterniflora*) & at Upland Borders (*Prunus serotina*)
- Trail Construction
- Platform Viewing
- Proper Signage



Case Study 3:

Pickering Brook, Greenland



The Issue:

Ditching + Loss of
Open Water Habitat = Mosquitoes



The Solution: Ditch Plugging & Creation of Pools



NH Salt Marsh Restoration Status

31 Tidal Restrictions Identified by NRCS

- 16 have been eliminated Restoring 450+ acres of marsh
- 7 are probably permanent
- 3 are doable but difficult
- 6 are in planning or progress

Other Projects Involve : Ditch Plugging & Open Water Habitat Creation, Fill Removal, Invasive Species Remediation, and Mosquito Control

16 projects restoring about 118 acres of marsh

Additional Saltmarsh Restoration Projects In Planning Or Underway

- Bass Beach, Rye – 5.6 acres
- Brown's River, Seabrook - 42 acres
- Fairhill Marsh, Rye
- Meadow Pond Phragmites Control
- New Castle, various sites - 10.9 acres
- Odiorne Boat Launch – 1 acre

It is possible and within our reach to restore all the restorable marshes in New Hampshire.

Other Projects & Studies

- Coastal Freshwater Wetland Mitigation Inventory – 19 Communities
- Coastal Wetland Design & Engineering Agreement
- Tidal Wetland Habitat Inventory & Photoanalysis of Degraded Coastal Wetlands
- Saltmarsh Monitoring

Saltmarsh Monitoring in NH

GPAC Protocols require pre- and post-restoration monitoring for the following parameters:

- Root zone salinity & Groundwater
- Vegetative Communities
- Fish Assemblages
- Bird Usage
- Other Water Quality Parameters

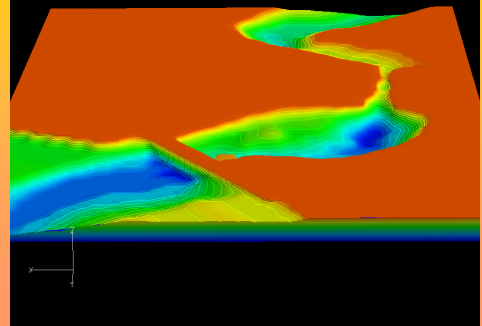


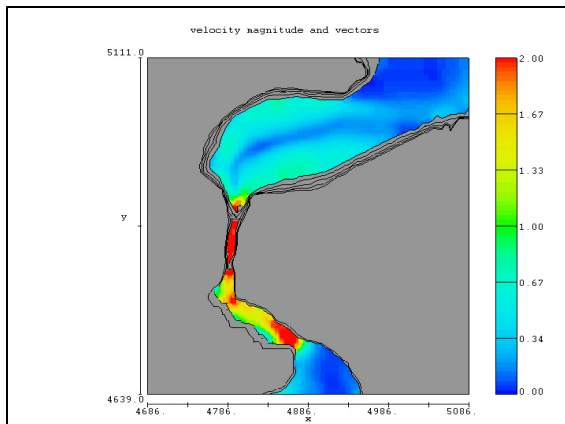
Marsh Monitors – Over 50 volunteers in partnership with Ducks Unlimited – **YOU CAN BE A MARSH MONITOR, TOO!**

River Restoration

- Winnicut River Dam Removal Feasibility Study
- Cocheco River Projects
- Other fish passage projects

Winnicut River Dam





Thank You!

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